ORIGINAL ARTICLE

A Study of Risk Factors of Stroke in Department of Neurology at GMC/DHQ Teaching Hospital Gujranwala

SAJJAD NASEER, IMRAN ASGHAR KHAN, ABDUSSLAM, JAVED IQBAL ZUBERI
DHQ Teaching Hospital Gujranwala Medical College, Gujranwala, Pakistan

ABSTRACT

Objective: *To evaluate pattern and risk factors of strokes admitted in the department of neurology GMC/DHQ teaching hospital Gujranwala.*

Materials and Methods: *This study was conducted at GMC Gujranwala during January 2018.*

Results: *During the month of January 2018 total number of admitted patients were 400. Out of these one hundred were of stroke. Males were 61, females were 39. Mean age was 57 years while the mean hospital stay was 6.2 days. Among these 100 cases, cerebral infarction were in 54 patients and hemorrhagic in 46 patients. We observed that most of cerebral infarction were in territory of middle cerebral artery, and intracerebral hemorrhages were mostly thalamic region followed putamen. It was further seen that hypertension was the most common risk factor in 56 patients, ischemic heart disease (IHD) 28, and diabetes in 10 patients. The mortality was 20% more in patients of hemorrhagic strokes. Glasgow coma scale was an important determinant of outcome of stroke.*

Conclusion: *Our study concluded that Ischemic Strokes are slightly higher than Hemorrhages stroke. GCS is an important determinant in the outcome of stroke. 33% of intracerebral bleeds die shortly after admission.*

Key Words: *Stroke, Cerebrovascular Disease.*

INTRODUCTION

Stroke is defined as the focal neurological deficit due to a vascular lesion which may be a cerebral infarction or any type of intracranial hemorrhage.

Cerebrovascular diseases are among the most common and devastating neurologic disorders: which are ischemic stroke and hemorrhagic stroke. It is the second leading cause of death worldwide, with 6.2 million dying from stroke in 2015, an increase of 830,000 since the year 2000. In fact, it has grown in incidence worldwide. However, it is declining, among the affluent and rising among those with less access to medical care. It accounts for physical and mental disability in elderly. Its incidence is higher in countries where management of risk factors is yet not optimum.

The main symptoms vary depending upon the size, site or the nature of neurological lesions. Paralysis is one of the main symptoms of stroke. Soon after having a stroke the patient may present with hemiplegia or monoplegia. The patient may manifest other problems such as incontinence, pain, deficit in vision, speech communication problems, memory loss and deficit in intellect.

Performance of daily living activities slowly progresses after onset and by the time of discharge two third of the patients experience significant improvement. The recovery occurs within two to three months and reaches a plateau in six months. Though there may be some improvement after this, very small improvement is noticed after two years.[2]

The department of neurology GMC/DHQ Gujranwala deals with acute neurological problems of which the stroke constitutes more than 50%. The department manages and evaluates stroke in different stages from a few hours to months, with variable severity, complications and risk factors.

A study is carried out to look at the various epidemiological aspects, and risk factors of stroke

Date of Submission: 17-2-2019
Date of Printing: 15-3-2019

admitted in the department of neurology GMC/DHQ teaching hospital Gujranwala during the month of January 2018.

MATERIALS AND METHODS

A prospective study was conducted in the department of neurology GMC/DHQ teaching hospital during the month of January 2018 for evaluation of all the stroke patients.

Inclusion Criteria

All those patients with the evidence of hemorrhage or infarct on brain imaging were included in this study.

Exclusion Criteria

Patients diagnosed to have tuberculosis, meningitis, tuberculoma, brain tumor, viral or bacterial encephalitis and multiple sclerosis were excluded.

A questionnaire was designed in which the demographic, clinical properties with special emphasis on duration of stay in hospital, GCS at presentation, neurological deficit along with risk factors and the outcome of the patient were recorded. In each case CT or MRI, were done along with serum glucose, urea & creatinine, echocardiography, ECG, fasting lipid profile, carotid Doppler studies, LFTs, and CBC were done. Total admissions were 400 and the number of strokes were 100.

RESULTS

During the month of January 2018 total number of admitted patients were 400. Out of these one hundred were of stroke. Males were 61, females were 39 (Table 1). Mean age was 57 years (Table 2) while the mean hospital stay was 6.2 days (Table 3). Among these 100 cases, cerebral infarction were in 54 patients and hemorrhagic in 46 patients (Graph 2). We observed that most of cerebral infarction were in territory of middle cerebral artery, and intracerebral hemorrhages were mostly thalamic region followed putamen (Fig. 3). It was further seen that hypertension was the most common risk factor in 56 patients, ischemic heart disease (IHD) 28, and diabetes in 10 patients (Table 4). The mortality was 20% more in patients of hemorrhagic strokes (Table 7). Glasgow coma scale was an important determinant of outcome of stroke (Graph 3).

Table 1: *Gender Distribution.*

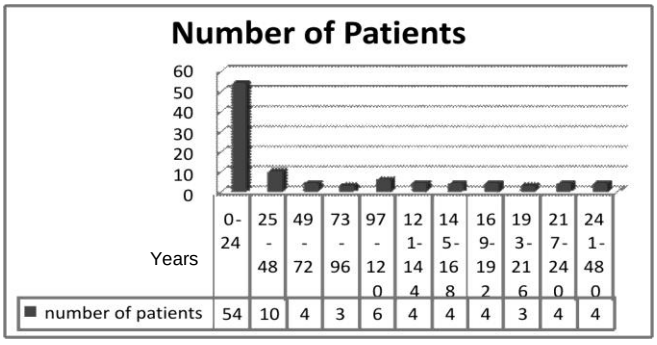
Gender	Number	Percentage
Males	61	61%
Females	39	39%
Total	100	100%

Table 2: *Gender and Age.*

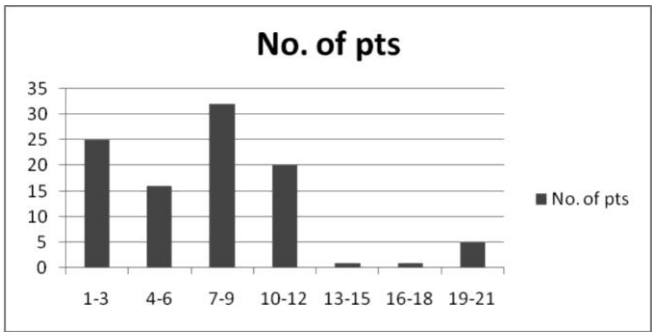
Gender	Mean Age
Males	57.17 Years
Females	51.5 Years

Table 3: *Hospital Stay.*

Stay in the Hospital	Duration in Hours
Males	67.9 Hours
Minimum	2 Hours
Maximum	480 Hours



Age in Years
Graph 1: *Age Distribution.*



Hospital stay – mean (6.2 days)
Graph 2: *Hospital Stay (Days).*

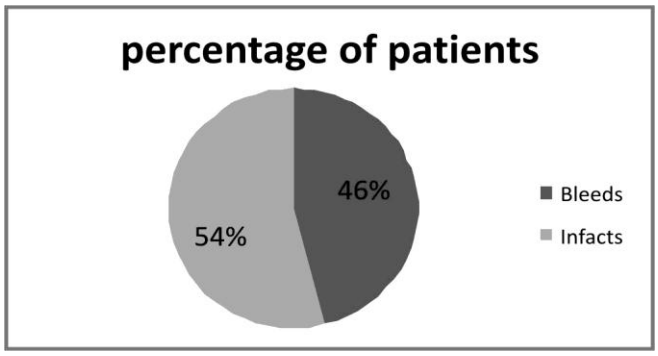
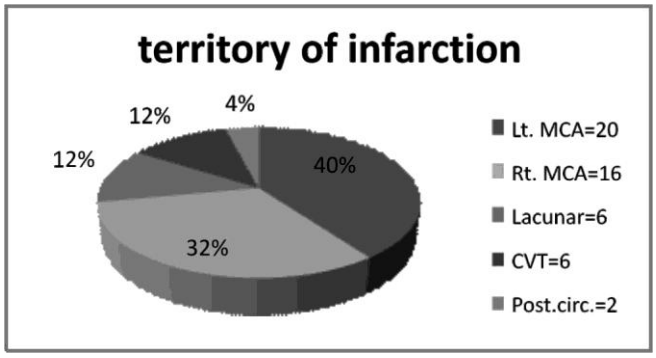


Fig. 1: *Types of Stroke.*



Territory of Intracerebral Bleeds
Fig. 2: *Distribution of Ischemic Stroke.*

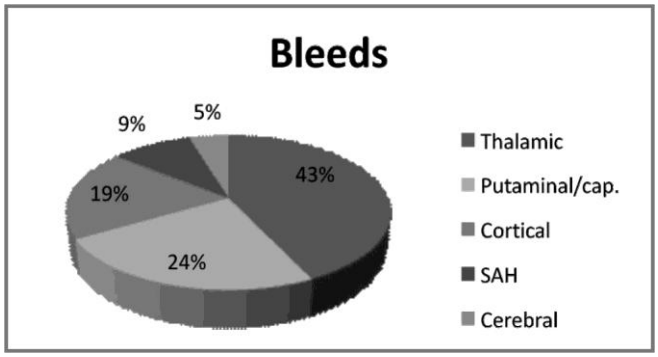


Fig. 3: *Distribution of Haemorrhagic Stroke.*

Table 4: *Risk Factors.*

Risk Factors	**Number and Percentage**
Total patients	100
Hypertension	54
Ischemic heart disease	24
Diabetes	20
Valvular heart disease	2

Table 5: *Risk Factor and Type of Stroke.*

Risk Factor	Infarcts	Bleeds	Total
Diabetes	18	2	20
Hypertension	26	28	54
IHD	18	8	26
DM & Hypertension	16	2	18

Table 6: *Mortality.*

Total number of patients	100
Mortality	15

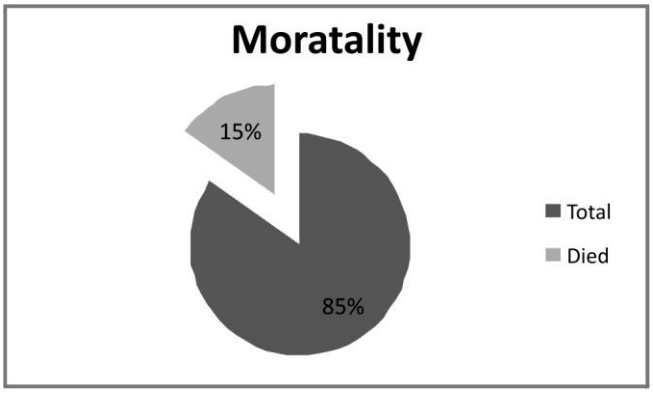


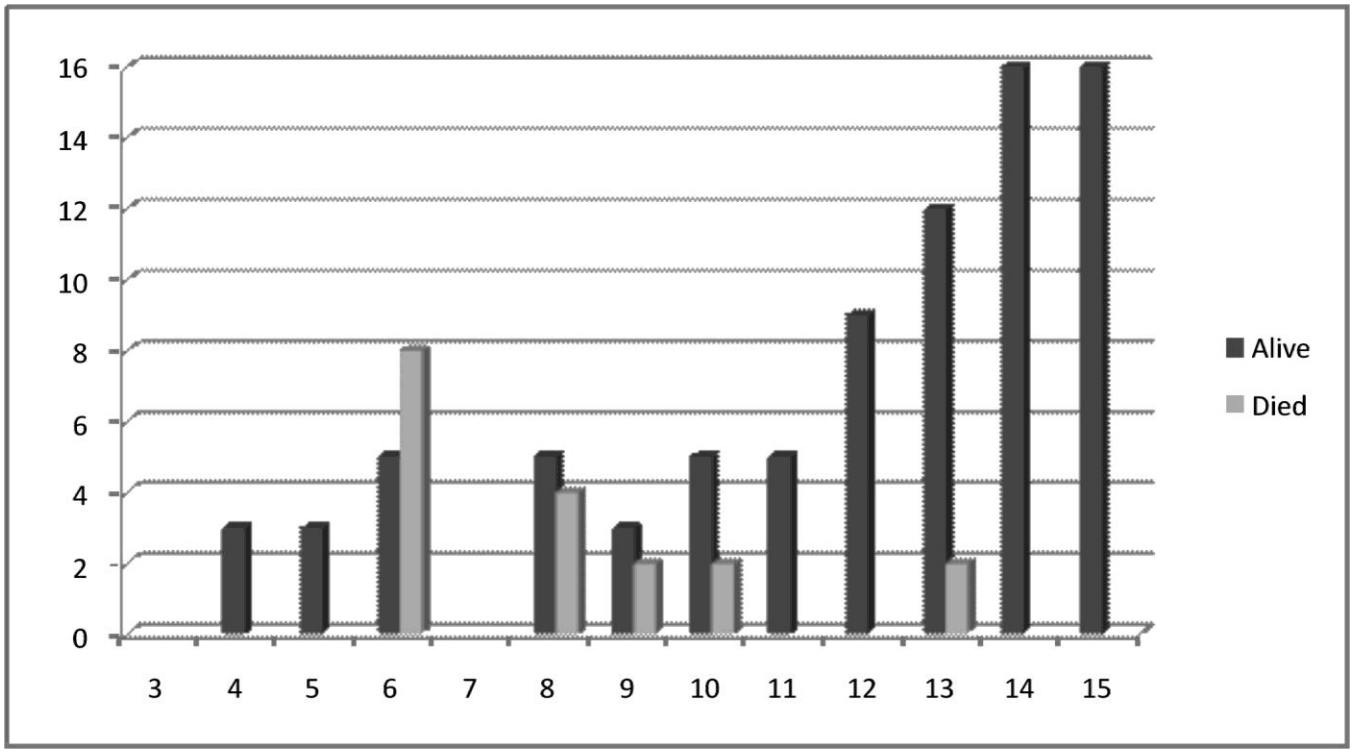
Fig. 4: *Mortality.*

Table 7: *Types of Stroke and Mortality.*

Total Mortality	**15 (66%)**
Bleeds	10
Thalamic	4
Putaminal	4
Cortical	2
Infarcts	**5 (33%)**
Top of basilar artery	3
Large left MCA	2

DISCUSSION

The department of neurology GMC/DHQ teaching hospital Gujranwala is20 bed acute ward with separate beds in ICU, and private ward. Considering 400 admissions on 20 beds it means on average, there were six admissions per day and the patient did not stay for more than a week. Male: female ratio is considered to be the same in CVA as compared to myocardial



Graph 3: *Glasgow coma scale and outcome.*

Table 8: *Mortality Evaluation.*
B: Bleed I: Infarct

Age (Years)	Sex	Stay (Days)	GCS	Types of Stroke Bleed (B)/Infarct (I)	Risk Factors		
					DM	HTN	IHD
70	M	11	6	B- Cort. (AVM)	+	-	+
52	M	10	10	I-TOB	+	+	+
75	M	13	7	B- putaminal	-	+	-
59	M	11	10	I-Lt MCA territory	+	+	+
62	F	7	6	Lobar bleed (Rt. frontal)	-	+	-
65	M	8	9	B- Thalamic & vent. Ext	-	+	+
60	F	5	5	B-Right thalamic	-	+	+
50	M	8	6	B- Thalamic & vent. Ext	-	+	-
70	M	10	7	I-Rt. (TACS)	+	+	+
40	M	1	9	B-Putamen	-	+	-
50	F	2	4	B- putamen with ventricular extension	_	+	+
60	F	2	8	B-Putamen	+	+	-
60	M	3	13	B-Putamen	-	+	+
60	F	2	6	I-Lt MCA	+	+	+
56	F	6	8	I-Rt. MCA	+	+	+

infarction where males predominate the disease. But in our study, we find that males were predominant.[3,4,9] The reason may be more males were brought to hospital considering social importance and financial aspects. Women encounter significant obstacles that limit their access to quality care compared with men.

Mean age was 57.17 years, while the mean age in males 60.82 years, in females 51.5 years.[4-8] In a study by Moroney JI and Bagiela E., from Columbia university mean age of stroke was 72 years.[10] This was because of better control of risk factors like hypertension, and diabetes in the American population. Being an acute ward most of cases 78 out of 100 were taken with an illness of less than 24 hours. The policy of the department was that we did not admit with a stroke of more than 7 days, rather such strokes are treated as OPD cases.

GCS was one of the most important determinants in the outcome of patients with stroke; 8 out of 16 patients who died had GCS 6, while 16 patients with GCS 15 were alive.[1]

All the studies from western community had shown that the ratio of cerebral infarction to hemorrhage is 80:20.[11,12] Higher rates of hemorrhage strokes exist in black people, but among embolic stroke and extra cranial occlusive vascular disease more in whites had been reported.

In our study ratio between hemorrhage stroke and cerebral infarction is almost same, as study sample is biased. Higher prevalence of hypertension among black people is a possible reason for increase hemorrhagic stroke, as a recent study suggested ethnic differences in genetic predisposition to hypertension.

The distribution of the subtypes of cerebral infarction in the Oxford shire community stroke project[13] showed that anterior circulation was involved in 51%, lacunar 25%, and posterior 24%. Our study showed that anterior circulation was involved in 71% and posterior circulation 4%, lacunar 12% and cortical vein thrombosis in 12% of patients. Epidemiological studies have identified various risk factors for stroke, like hypertension, ischemic heart disease, diabetes mellitus, smoking and hyperlipidemia. In our study hypertension is the most common risk factor 59%. More recent studies have convincingly demonstrated that the long term better control of hypertension decreased the incidence of both cerebral infarction and intra cerebral hemorrhage.[14-18]

Diabetes is found in 21%, Weinberger et al., have found diabetic patients to be twice as liable to stroke as age matched non diabetic groups.[19-21]

Mortality as one month is about 20% for stroke, but much higher after primary intra cerebral hemorrhage. Out of 15, who died 13 were due to intra cerebral hemorrhage and 2 cerebral infarctions, this comparable with studies done by Klaus Kaae Andersen et al[22].

Out of survivors 50% recovered completely, while the rest had a residual deficit after a month. Good prognostic factor for recovery included young age, GCS more than12 at initial presentation and mild neurological deficit.

CONCLUSION

Our study concluded that Ischemic Strokes are slightly higher than Hemorrhages stroke. GCS is an important determinant in the outcome of stroke. 33% of intracerebral bleeds die shortly after admission.

For Correspondence
Dr. Sajjad Naseer, MBBS
FCPS (Neurology), FAAN. MRCP (UK),
MRCP (Ireland), FRCP
American Board of Electrodianostic Medicine and Neuromuscular Disorder
Professor and Head- Department of Neurology
Gujranwala Medical College, Gujranwala
E-mail: Alhashmi63@gmail.com

ROLE OF AUTHORS

Dr. Sajjad Naseer, Paper Writing.
Dr. Imran Asghar Khan, Literature Search.
Dr. Abdusslam, Data Collection.
Dr. Javed Iqbal Zuberi, Tables and Graphs.

REFERENCES

1. Jack W. Tsao, DPhil; J. Claude Hemphill III, S. Claiborne Johnston, et al. Initial Glasgow Coma Scale Score Predicts Outcome Following Thrombolysis for Posterior Circulation Stroke. Arch Neurol. 2005; 62 (7): 1126-1129.
2. Mark T. Smith BSc, Gillian D. Baer MSc. Archives of Physical Medicine and Rehabilitation. Science Direct; April 1999; Volume 80, Issue 4: Pages 442-447.
3. Mathew J Reeves, Chery D Bushnell, George Howard, Julia Warner Gargano, Pamela W Duncan, Gwen Lynch, Arya Khatiwoda, and Lynda Lisabeth, Sex differences in stroke: epidemiology, clinical presentation, medical care, and outcomes. Lancet Neurol. 2008 Oct; 7 (10): 915–926.

4. Xiao-ying Yao, Yan Lin, Jie-li Geng, Ya-meng Sun, Ying Chen, Guo-wen Shi, Qun Xu, and Yan-sheng Li. Age- and Gender-Specific Prevalence of Risk Factors in Patients with First-Ever Ischemic Stroke in China.Stroke Res Treat. 2012; 2012: 136398.
5. Niewada M, Kobayashi A, Sandercock PA, Kamiński B, Członkowska A. International stroke trial collaborative group. Influence of gender on baseline features and clinical outcomes among 17,370 patients with confirmed ischemic stroke in the international stroke trial. Neuroepidemiology, 2005; 24 (3): 123–128.
6. Ayala C, Croft JB, Greenlund KJ, et al. Sex differences in US mortality rates for stroke and stroke subtypes by race/ethnicity and age, 1995-1998. Stroke, 2002; 33 (5): 1197–1201.
7. Huang Y, Wang JG, Wei JW, et al. Age and gender variations in the management of ischaemic stroke in China. International Journal of Stroke, 2010; 5 (5): 351–359.
8. Andersen KK, Andersen ZJ, Olsen TS. Age- and gender-specific prevalence of cardiovascular risk factors in 40 102 patients with first-ever ischemic stroke: a Nationwide Danish Study. Stroke, 2010; 41 (12): 2768–2774.
9. Giralt D, Domingues-Montanari S, Mendioroz M, et al. The gender gap in stroke: a meta-analysis. Acta Neurologica Scandinavica. 2012; 125 (2): 83–90.
10. Moroney JT, Bagiella E, Paik MC, Sacco RL, Desmond DW. Risk factors for early recurrence after ischemic stroke: the role of stroke syndrome and subtype. Stroke. 1998 Oct; 29 (10): 2118-24.
11. Klaus Kaae Andersen, Tom Skyhøj Olsen. Christian Dehlendorff, MS; Lars Peter Kammersgaard, MD. Hemorrhagic and Ischemic Strokes Compared Stroke Severity, Mortality, and Risk Factors. Stroke, 2009; 40: 2068-2072.
12. Hajat C, Dundas R, Stewart JA, Lawrence E, Rudd AG, Howard R, Wolfe CDA. Cerebrovascular risk factors and stroke subtypes. Differences between ethnic groups. Stroke, 2001; 32: 37– 42. 21.
13. The Oxfordshire Community Stroke Project Classification: Correlation with imaging, associated complications, and prediction of outcome in acute ischemic stroke.Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association**,** February, 2003; 12 (1): 17.
14. Zaki Noah Hasan, Mousa Qasim Hussein, and Ghazi Farhan Haji. Hypertension as a Risk Factor: Is It Different in Ischemic Stroke and Acute Myocardial Infarction Comparative Cross-Sectional Study? Int J Hypertens. 2011; 2011: 701029.
15. Lawes C, Bennett DA, Feigin VL, Rodgers A. Blood pressure and stroke: an overview of published reviews. Stroke, 2004; 35 (3): 776–785.
16. Lakhan SE, Sapko MT. Blood pressure lowering treatment for preventing stroke recurrence: a systematic review and meta-analysis. International Archives of Medicine, 2009; 2 (1, article 30).
17. Vasan RS, Larson MG, Leip EP, et al. Impact of high-normal blood pressure on the risk of cardiovascular disease. The New England Journal of Medicine, 2001; 345 (18): 1291–1297.
18. Cífková R. Epidemiology and risk of hypertension. Archives of Medical Science, 2009; 5 (2A): S199–S211.
19. Brett M. Kissela, Jane Khoury, Dawn Kleindorfer, Daniel Woo, Alexander Schneider, MD1, Kathleen Alwell, RN1, Rosemary Miller, RN1, Irene Ewing, Charles J. Moomaw, Jerzy P. Szaflarski, James Gebel, Rakesh Shukla, and Joseph Broderick. Epidemiology of Ischemic Stroke in Patients with Diabetes. The Greater Cincinnati/Northern Kentucky Stroke Study. Diabetes Care, 2005 Feb; 28 (2): 355-359.
20. Mokdad AH, Ford ES, Bowman BA, Dietz WH, Vinicor F, Bales VS, Marks JS: Prevalence of obesity, diabetes, and obesity-related health risk factors, 2001. JAMA. 2003; 289: 76–79.
21. Jesse Weinberger, M.D., Victoria Biscarra, R.N., Michael K. Weisberg., B.S., Julius H. Jacobson, M.D. Factors Contributing to Stroke in Patients with Atherosclerotic Disease of the Great Vessels: The Role of Diabetes. Stroke, 1983; Vol. 14, No 5.
22. Klaus Kaae Andersen, Tom Skyhøj Olsen, Christian Dehlendorff, and Lars Peter Kammersgaard**.** Hemorrhagic and Ischemic Strokes Compared. Stroke Severity, Mortality, and Risk Factors. Stroke, 2009; 40: 2068–2072.

Date of Submission: 17-2-2019
Date of Printing: 15-3-2019